Marked-up Version of Amended Specification Pursuant to 37 C.F.R. §§ 1.121(b)

The following paragraphs have been amended in the Specification:

Page 2, starting at line 15, has been changed as follows:

Figure 1 represents the circuit 10 used in the IEEE paper to measure cross coupling capacitance. A general method to measure capacitance consists of measuring the total charge deposited on the capacitor, which can be accomplished by measuring DC currents, frequency of applied signals, and voltage. The following formula permits the determination of capacitance:

$$I = CV_{dd}f \qquad \text{(Equation 1)}$$

where I is a dc current reading, C is a load capacitance, V_{dd} is the voltage supply level, and f is the frequency of the waveforms applied.

Page 3, starting at line 1, has been changed as follows:

The voltage waveform of **Figure 2** used in the IEEE paper are non-overlapping waveforms that provide, except for leakage, no current path between V_{dd} and ground in the circuit of Figure 1. In the IEEE paper, the unknown capacitance is measured as the difference between two current readings on the two current meters 12, 14 in Figure 1. The process is flawed because of charge redistribution. The capacitance coupling between two structures, depends on the presence of other nearby structures.

Page 3, starting at line 7 has been changed as follows:

Consider in Figure 1, two identical load structures, C and C'. The capacitance of C to ground on the ~~left~~ right side of the structure is different from the capacitance C' to ground on the ~~right~~ left side. The difference is due to the redistribution of the electric field due to the presence of the second conductor 16. The capacitance difference can be quite large.

Page 3, starting at line 11 has been changed as follows:

Configurations like the one shown in **Figure 3**, where the load wire 18 and its neighbors 20,22 are on the same physical layer and are separated by minimum distance, constitute a case where the direct application of the method of the IEEE paper would result in up to 70% error in the extraction of the unknown cross coupling capacitance. There is, in addition, the uncertainty related to the lack of equality in the capacitance of the transistors on the two sides of the mirror structure. This additional source of error becomes more significant as the device size decreases.

Page 5, starting at line 15 has been changed as follows:

~~**Figure 7** is one among the multiple extensions of the measuring device method shown in Figure 4 to multiple wire configurations.~~

Page 7, starting at line 12 has been changed as follows:

The invention provides a method and apparatus for determining cross coupling capacitance of wires in an integrated circuit. ~~;~~ T~~t~~otal capacitance can be determined by adding the different cross coupling capacitance. The capacitance information derived according to the invention can be used, for example, to calibrate a parasitic extraction engine or to calibrate an integrated circuit fabrication process. The capacitance information can also be used to improve timing and noise simulations of circuits particularly for deep sub-micron circuits since wire capacitance effects play a dominant role for deep submicron circuits.

Page 8, starting at line 7 has been changed as follows:

The main structure 405 of Figure 4 includes ammeter 400, transistor 410, transistor 420 and a minimum size structure that connects load wire 440 with the main structure. In the example of Figure 4, load wire 440 and neighbor wire 450 are on the Metal2 layer; however, ~~Metal2 layer wires are not required~~ the particular metal layer or layers the wires are on is not relevant . In the embodiment of Figure 4, load wire 440 is coupled to the main structure by Metal1-via-Metal2 structure 435 and wire 430.

Page 8, starting at line 12 has been changed as follows:

The circuit of Figure 4 is used to measure cross coupling capacitance between wire 440 and wire 450. ~~Wire 440 is parallel to wire 450.~~ Inverter 460 is coupled to wire 450 by wire 455.

In one embodiment, inverter 460 is far enough away from the main structure to reduce noise input on wire 400.

Page 9, starting at line 7 has been changed as follows:

Before applying the voltage waveforms of Figure 5, ~~the~~ a voltage $V_3 = V_{dd}$, (or ground) is applied to the external inverter 460~~, $V_3 = V_{dd}$, (or ground)~~. Ammeter 400 is used to measure the charge, Q, that flows into node 600 of Figure 6. Node 600 gets charged when $V_2 = V_1 = 0$, and this charge is equal to:

$$Q = I / f = (C_1 + C_2 + C_{coupling})V_{dd} \qquad \text{(Equation 2)}$$

The measurement proceeds by applying for a sufficiently large number of cycles a periodic signal to V_3, having the same frequency as the signal applied to V_1, V_2. The relative rise and fall times of the external signals do not matter.